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P#-18   1600

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RAW SEQUENCE LISTING   DATE: 05/14/2003
PATENT APPLICATION: US/09/676,249C   TIME: 08:07:42

Input Set : A:\3153.162.PC10555A.Substitute.Seq.ST25.txt
Output Set: N:\CRF4\05142003\I676249C.raw

```
 3 <110> APPLICANT: King, Kendall W.
 4        Madura, Rebecca A
 5        Rosey, Everett L
 7 <120> TITLE OF INVENTION: NUCLEIC ACIDS AND PROTEINS OF THE MYCOPLASMA HYOPNEUMONIAE
mhp3
 8        GENE AND USES THEREOF
10 <130> FILE REFERENCE: 3153.00162/PC10555
12 <140> CURRENT APPLICATION NUMBER: US 09/676,249C
13 <141> CURRENT FILING DATE: 2000-09-29
15 <150> PRIOR APPLICATION NUMBER: US Prov. 60/156,602
16 <151> PRIOR FILING DATE: 1999-09-29
18 <160> NUMBER OF SEQ ID NOS: 42
20 <170> SOFTWARE: PatentIn version 3.2
22 <210> SEQ ID NO: 1
23 <211> LENGTH: 1692
24 <212> TYPE: DNA
25 <213>_ORGANISM: Mycoplasma hyopneumoniae
27 <400> SEQUENCE: 1
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30 tcatcgtaat taaaacaatt aattaggaga acaactatga aaaaaaagat aaaatgaaat     120
32 aaatttcttg gcttaggctt agttttttccg ctttcagcaa tcgcgacaat ctctgccgga     180
34 tgttgggata aagaaacaac taaagaagaa aaatcagccg ataatcaaaa taagcaaatc     240
36 actgatgtct caaaaatttc aggactagtt aatgaacgaa aatccgaaat tatggccgca     300
38 aaagctgatg caaacaaaca ttttgggcta aatatggcaa ttgtaaccgc tggtggaacg     360
40 gtaaatgata attcatttaa ccaatcaagt tgagaggcaa ttcaacaact tggcgctctt     420
42 actggaggtg agattacttc agtagatagt tcaactgctg aacttgaagg aaaatatagc     480
44 tcacttgcta ataccaacaa aaatgtttga gtactttctg gttttcaaca cggtgatgcg     540
46 ttcacaagat gattaaaaat ccctgaaaat aagcaattat ttactgaaaa aaatattatc     600
48 atactcggaa ttgactgaac tgatactgaa aatgtaattc caacaggtcg atatattaat     660
50 ttaacctata aaactgaaga agccggatga cttgcaggat atgcgaatgc ttccttttttg     720
52 gcaaaaaaat tcccaagtga tccaactaaa agatcagcaa ttgttatcgg tggtgggatt     780
54 tcgccagctg taactgattt tatcgctggt tatctagccg gaattaaagc ttgaaatcta     840
56 aaaaattctg ataaaaaaac aaagataaca actgataaaa tcgagataaa tcttgggttt     900
58 gatgttcaag atacttcaac aaaagaaaga cttgaacaaa ttgcttcaaa agataaacct     960
60 tcaacactat tagctgtcgc tggaccactt actgaaattt tctcggatat aatcgcaaac    1020
62 caaaatgatc gttatctcat tggtgttgac accgaccaat cacttgttta tacaaaaact    1080
64 aaaaataaat ttttcacctc aattttgaaa aatttaggtt actccgtttt cagcgttctt    1140
66 agtgatttat ataccaaaaa atcaaattca agaaatttag ccggctttga atttggtaaa    1200
68 aaaagtgcaa ccgtttatct tggaattaaa gacaggtttg tcgatattgc tgatacttct    1260
70 ttagaaggca atgataaaaa actcgcaact gaagccattt ctgaagctaa aaaagaattt    1320
72 gaagaaaaaa ctaagacaat tcctgccgaa gaagttcgta aaactttaga aattccggaa    1380
74 atgcctgata aacaacctga taagcaacag gaaagcttag acaaactaat taccgatatt    1440
76 aataaaaatt aagtaagaaa aaataacaat tttttaacat tatatctttt tttagagatt    1500
78 aattttcttc taatttagtt taatttaata taaaattata ttaaattaaa aaaataaaaa    1560
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 80 atccggacta ttttttgttcc ggattttttta ttttttgtgtt actatttaat ataatgataa   1620
 82 atcaggatta tgcaattgaa tttattcaag tctcgaaaaa atttggcagt ttttatgcca   1680
 84 attacaaaat ag                                                        1692
 87 <210> SEQ ID NO: 2
 88 <211> LENGTH: 451
 89 <212> TYPE: PRT
 90 <213> ORGANISM: Mycoplasma hyopneumoniae
 92 <400> SEQUENCE: 2
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 95 1               5                   10                  15
 98 Phe Pro Leu Ser Ala Ile Ala Thr Ile Ser Ala Gly Cys Trp Asp Lys
 99             20                  25                  30
102 Glu Thr Thr Lys Glu Glu Lys Ser Ala Asp Asn Gln Asn Lys Gln Ile
103         35                  40                  45
106 Thr Asp Val Ser Lys Ile Ser Gly Leu Val Asn Glu Arg Lys Ser Glu
107     50                  55                  60
110 Ile Met Ala Ala Lys Ala Asp Ala Asn Lys His Phe Gly Leu Asn Met
111 65                  70                  75                  80
114 Ala Ile Val Thr Ala Gly Gly Thr Val Asn Asp Asn Ser Phe Asn Gln
115             85                  90                  95
118 Ser Ser Trp Glu Ala Ile Gln Gln Leu Gly Ala Leu Thr Gly Gly Glu
119             100                 105                 110
122 Ile Thr Ser Val Asp Ser Ser Thr Ala Glu Leu Glu Gly Lys Tyr Ser
123         115                 120                 125
126 Ser Leu Ala Asn Thr Asn Lys Asn Val Trp Val Leu Ser Gly Phe Gln
127     130                 135                 140
130 His Gly Asp Ala Phe Thr Arg Trp Leu Lys Ile Pro Glu Asn Lys Gln
131 145                 150                 155                 160
134 Leu Phe Thr Glu Lys Asn Ile Ile Ile Leu Gly Ile Asp Trp Thr Asp
135                 165                 170                 175
138 Thr Glu Asn Val Ile Pro Thr Gly Arg Tyr Ile Asn Leu Thr Tyr Lys
139             180                 185                 190
142 Thr Glu Glu Ala Gly Trp Leu Ala Gly Tyr Ala Asn Ala Ser Phe Leu
143         195                 200                 205
146 Ala Lys Lys Phe Pro Ser Asp Pro Thr Lys Arg Ser Ala Ile Val Ile
147     210                 215                 220
150 Gly Gly Gly Ile Ser Pro Ala Val Thr Asp Phe Ile Ala Gly Tyr Leu
151 225                 230                 235                 240
154 Ala Gly Ile Lys Ala Trp Asn Leu Lys Asn Ser Asp Lys Lys Thr Lys
155             245                 250                 255
158 Ile Thr Thr Asp Lys Ile Glu Ile Asn Leu Gly Phe Asp Val Gln Asp
159             260                 265                 270
162 Thr Ser Thr Lys Glu Arg Leu Glu Gln Ile Ala Ser Lys Asp Lys Pro
163         275                 280                 285
166 Ser Thr Leu Leu Ala Val Ala Gly Pro Leu Thr Glu Ile Phe Ser Asp
167     290                 295                 300
170 Ile Ile Ala Asn Gln Asn Asp Arg Tyr Leu Ile Gly Val Asp Thr Asp
171 305                 310                 315                 320
174 Gln Ser Leu Val Tyr Thr Lys Thr Lys Asn Lys Phe Phe Thr Ser Ile
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Input Set : A:\3153.162.PC10555A.Substitute.Seq.ST25.txt
Output Set: N:\CRF4\05142003\I676249C.raw

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175                  325                  330                  335
178 Leu Lys Asn Leu Gly Tyr Ser Val Phe Ser Val Leu Ser Asp Leu Tyr
179        .         340                  345                  350
182 Thr Lys Lys Ser Asn Ser Arg Asn Leu Ala Gly Phe Glu Phe Gly Lys
183            355                  360                  365
186 Lys Ser Ala Thr Val Tyr Leu Gly Ile Lys Asp Arg Phe Val Asp Ile
187        370                  375                  380
190 Ala Asp Thr Ser Leu Glu Gly Asn Asp Lys Lys Leu Ala Thr Glu Ala
191 385                  390                  .395                  400
194 Ile Ser Glu Ala Lys Lys Glu Phe Glu Glu Lys Thr Lys Thr Ile Pro
195                  405                  410                  415
198 Ala Glu Glu Val Arg Lys Thr Leu Glu Ile Pro Glu Met Pro Asp Lys
199                  420                  425                  430
202 Gln Pro Asp Lys Gln Gln Glu Ser Leu Asp Lys Leu Ile Thr Asp Ile
203            435                  440                  445
206 Asn Lys Asn
207        450
210 <210> SEQ ID NO: 3
211 <211> LENGTH: 1263
212 <212> TYPE: DNA
213 <213> ORGANISM: Artificial Sequence
215 <220> FEATURE:
216 <223> OTHER INFORMATION: Description of Artificial Sequence: mhp3 manipulated for in
vitro
217       expression
219 <400> SEQUENCE: 3
220 atgtgggata aagaaacaac taaagaagaa aaatcagccg ataatcaaaa taagcaaatc      60
222 actgatgtct caaaaatttc aggactagtt aatgaacgaa aatccgaaat tatggccgca     120
224 aaagctgatg caaacaaaca ttttgggcta aatatggcaa ttgtaaccgc tggtggaacg     180
226 gtaaatgata attcatttaa ccaatcargt tgggaggcaa ttcaacaact tggcgctctt     240
228 actggaggtg agattacttc agtagatagt tcaactgctg aacttgaagg aaaatatagc     300
230 tcacttgcta ataccaacaa aaatgtttgg gtactttctg gttttcaaca cggtgatgcg     360
232 ttcacaagat ggttaaaaat ccctgaaaat aagcaattat ttactgaaaa aaatattatc     420
234 atactcggaa ttgactggac tgatactgaa aatgtaattc aacaggtcg atatattaat      480
236 ttaacctata aaactgaaga agccggatgg cttgcaggat atgcgaatgc ttcctttttg     540
238 gcaaaaaaat tcccaagtga tccaactaaa agatcagcaa ttgttatcgg tggtgggatt     600
240 tcgccagctg taactgattt tatcgctggt tatctagccg gaattaaagc ttggaatcta     660
242 aaaaattctg ataaaaaaac aaagataaca actgataaaa tcgagataaa tcttgggttt     720
244 gatgttcaag atacttcaac aaaagaaaga cttgaacaaa ttgcttcaaa agataaacct     780
246 tcaacactat tagctgtcgc tggaccactt actgaaattt ctcggatat aatcgcaaac      840
248 caaaatgatc gttatctcat tggtgttgac accgaccaat cacttgttta tacaaaaact     900
250 aaaaataaat ttttcacctc aattttgaaa aatttaggtt actccgtttt cagcgttctt     960
252 agtgatttat ataccaaaaa atcaaattca agaaatttag ccggctttga atttggtaaa    1020
254 aaaagtgcaa ccgtttatct tggaattaaa gacaggtttg tcgatattgc tgatacttct    1080
256 ttagaaggca atgataaaaa actcgcaact gaagccattt ctgaagctaa aaaagaattt    1140
258 gaagaaaaaa ctaagacaat tcctgccgaa gaagttcgta aaactttaga aattccggaa    1200
260 atgcctgata aacaacctga taagcaacag gaaagcttag acaaacttaa ttaccgatat    1260
262 taa                                                                 1263
265 <210> SEQ ID NO: 4
266 <211> LENGTH: 423
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RAW SEQUENCE LISTING   DATE: 05/14/2003
PATENT APPLICATION: US/09/676,249C   TIME: 08:07:42

Input Set : A:\3153.162.PC10555A.Substitute.Seq.ST25.txt
Output Set: N:\CRF4\05142003\I676249C.raw

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267 <212> TYPE: PRT
268 <213> ORGANISM: Artificial Sequence
270 <220> FEATURE:
271 <223> OTHER INFORMATION: Description of Artificial Sequence: mhp3 manipulated for in
272       vitro expression
275 <220> FEATURE:
276 <221> NAME/KEY: MISC_FEATURE
277 <222> LOCATION: (1)..(423)
278 <223> OTHER INFORMATION: Xaa is any amino acid
280 <400> SEQUENCE: 4
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283 1               5                   10                  15
286 Asn Lys Gln Ile Thr Asp Val Ser Lys Ile Ser Gly Leu Val Asn Glu
287             20                  25                  30
290 Arg Lys Ser Glu Ile Met Ala Ala Lys Ala Asp Ala Asn Lys His Phe
291         35                  40                  45
294 Gly Leu Asn Met Ala Ile Val Thr Ala Gly Gly Thr Val Asn Asp Asn
295     50                  55                  60
298 Ser Phe Asn Gln Ser Gly Trp Glu Ala Ile Gln Gln Leu Gly Ala Leu
299 65                  70                  75                  80
302 Thr Gly Gly Glu Ile Thr Ser Val Asp Ser Ser Thr Ala Glu Leu Glu
303             85                  90                  95
306 Gly Lys Tyr Ser Ser Leu Ala Asn Thr Asn Lys Asn Val Trp Val Leu
307             100                 105                 110
310 Ser Gly Phe Gln His Gly Asp Ala Phe Thr Arg Trp Leu Lys Ile Pro
311         115                 120                 125
314 Glu Asn Lys Gln Leu Phe Thr Glu Lys Asn Ile Ile Ile Leu Gly Ile
315     130                 135                 140
318 Asp Trp Thr Asp Thr Glu Asn Val Ile Pro Thr Gly Arg Tyr Ile Asn
319 145                 150                 155                 160
322 Leu Thr Tyr Lys Thr Glu Glu Ala Gly Trp Leu Ala Gly Tyr Ala Asn
323             165                 170                 175
326 Ala Ser Phe Leu Ala Lys Lys Phe Pro Ser Asp Pro Thr Lys Arg Ser
327         180                 185                 190
330 Ala Ile Val Ile Gly Gly Gly Ile Ser Pro Ala Val Thr Asp Phe Ile
331         195                 200                 205
334 Ala Gly Tyr Leu Ala Gly Ile Lys Ala Trp Asn Leu Lys Asn Ser Asp
335     210                 215                 220
338 Lys Lys Thr Lys Ile Thr Thr Asp Lys Ile Glu Ile Asn Leu Gly Phe
339 225                 230                 235                 240
342 Asp Val Gln Asp Thr Ser Thr Lys Glu Arg Leu Glu Gln Ile Ala Ser
343             245                 250                 255
346 Lys Asp Lys Pro Ser Thr Leu Leu Ala Val Ala Gly Pro Leu Thr Glu
347         260                 265                 270
350 Ile Phe Ser Asp Ile Ile Ala Asn Gln Asn Asp Arg Tyr Leu Ile Gly
351         275                 280                 285
354 Val Asp Thr Asp Gln Ser Leu Val Tyr Thr Lys Thr Lys Asn Lys Phe
355     290                 295                 300
358 Phe Thr Ser Ile Leu Lys Asn Leu Gly Tyr Ser Val Phe Ser Val Leu
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PATENT APPLICATION: US/09/676,249C   TIME: 08:07:42

Input Set : A:\3153.162.PC10555A.Substitute.Seq.ST25.txt
Output Set: N:\CRF4\05142003\I676249C.raw

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359 305                   310                 315                 320
362 Ser Asp Leu Tyr Thr Lys Lys Ser Asn Ser Arg Asn Leu Ala Gly Phe
363             325                 330                 335
366 Glu Phe Gly Lys Lys Ser Ala Thr Val Tyr Leu Gly Ile Lys Asp Arg
367             340                 345                 350
370 Phe Val Asp Ile Ala Asp Thr Ser Leu Glu Gly Asn Asp Lys Lys Leu
371             355                 360                 365
374 Ala Thr Glu Ala Ile Ser Glu Ala Lys Lys Glu Phe Glu Glu Lys Thr
375     370                 375                 380
378 Lys Thr Ile Pro Ala Glu Glu Val Arg Lys Thr Leu Glu Ile Pro Glu
379 385                 390                 395                 400
382 Met Pro Asp Lys Gln Pro Asp Lys Gln Gln Glu Ser Leu Asp Lys Leu
383             405                 410                 415
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W--> 386 **Xaa Xaa Xaa Xaa Xaa Xaa Xaa**
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387             420
390 <210> SEQ ID NO: 5
391 <211> LENGTH: 602
392 <212> TYPE: DNA
393 <213> ORGANISM: Mycoplasma hyopneumoniae

395 <400> SEQUENCE: 5
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400 gagctatatt ttccttcaag ttcagcagtt gaactatcta ctgaagtaat ctcacctcca   180
402 gtaagagcgc caagttgttg aattgcctct caacttgatt ggttaaatga attatcattt   240
404 accgttccac cagcggttac aattgccata tttagcccaa aatgtttgtt tgcatcagct   300
406 tttgcggcca taatttcgga ttttcgttca ttaactagtc ctgaaatttt tgagacatca   360
408 gtgatttgct tattttgatt atcggctgat tttcttctt tagttgtttc tttatcccaa    420
410 catccggcag agattgtcgc gattgctgaa agcggaaaaa ctaagcctaa gccaagaaat   480
412 ttatttcatt ttatcttttt tttcatagtt gttctcctaa ttaattgttt taattacgat   540
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416 ac                                                                  602

419 <210> SEQ ID NO: 6
420 <211> LENGTH: 200
421 <212> TYPE: PRT
422 <213> ORGANISM: Mycoplasma hyopneumoniae

424 <400> SEQUENCE: 6
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427 1               5                 10                  15
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431             20                  25                  30
434 Thr Phe Leu Leu Val Leu Ala Ser Glu Leu Tyr Phe Pro Ser Ser Ser
435         35                  40                  45
438 Ala Val Glu Leu Ser Thr Glu Val Ile Ser Pro Pro Val Arg Ala Pro
439     50                  55                  60
442 Ser Cys Trp Ile Ala Ser Gln Leu Asp Trp Leu Asn Glu Leu Ser Phe
443 65                  70                  75                  80
446 Thr Val Pro Pro Ala Val Thr Ile Ala Ile Phe Ser Pro Lys Cys Leu
447             85                  90                  95
450 Phe Ala Ser Ala Phe Ala Ala Ile Ile Ser Asp Phe Arg Ser Leu Thr
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RAW SEQUENCE LISTING ERROR SUMMARY   DATE: 05/14/2003
PATENT APPLICATION: US/09/676,249C   TIME: 08:07:43

Input Set : A:\3153.162.PC10555A.Substitute.Seq.ST25.txt
Output Set: N:\CRF4\05142003\I676249C.raw

Please Note:
Use of n and/or Xaa have been detected in the Sequence Listing. Please review the
Sequence Listing to ensure that a corresponding explanation is presented in the <220>
to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:4; Xaa Pos. 417,418,419,420,421,422,423
Seq#:7; Xaa Pos. 3
Seq#:10; N Pos. 9,18,21
Seq#:12; N Pos. 6,9,12,18,21,24
Seq#:14; N Pos. 4,7,10,16,19,22